[redacted]

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MASSACHUSETTS

ANALOG DEVICES, INC. and HITTITE MICROWAVE LLC,

Plaintiffs,

v.

MACOM TECHNOLOGY SOLUTIONS HOLDINGS, INC. and MACOM TECHNOLOGY SOLUTIONS INC.,

Defendants.

Civil Action No.: 1:18-cv-11028-GAO

[redacted]

DECLARATION OF KEITH BENSON IN SUPPORT OF ANALOG'S MEMORANDUM OF LAW IN SUPPORT OF ITS MOTION FOR PRELIMINARY INJUNCTION

I, Keith Benson, declare the following:

1. I am the Product Line Director of RF/MW Amplifier & Phased Array IC Products at Analog Devices, Inc. and its wholly-owned subsidiary Hittite Microwave LLC (collectively, "Analog").

2. I submit this declaration in support of Analog's Memorandum of Law in Support of its Motion for Preliminary Injunction.

3. I have personal knowledge of the facts set forth in this declaration. If called upon as a witness, I could and would competently testify to the statements made herein.

4. I began working at Hittite Microwave in July 2004 as a Design Engineer.

[redacted]

5. In or about 2008/2009, Frank Traut was Hittite's Director of Integrated Circuit ("IC") Engineering, supervising product development work by many of Hittite's product design engineers. During Mr. Traut's time in this role at Hittite, he directed both me and Thomas Winslow.

6. In his role, Mr. Traut met regularly with Hittite's customers to understand their needs and product requirements. He also helped the company to set strategy for product development, and sat on Hittite's patent review committee. Among the products developed under Mr. Traut's supervision were Hittite's monolithic microwave integrated circuit ("MMIC") wideband distributed amplifiers.

7. Around 2008/2009, when Mr. Traut took on his role as Director of IC Engineering at Hittite, certain Hittite customers, including [redacted] asked for an MMIC amplifier product that could produce higher power output. Based on customer demand for higher power output, Hittite began development of a series of new MMIC amplifier products. I worked on this development project as an electrical engineer under Mr. Traut's supervision.

8. Higher power in such amplifiers requires a higher voltage, but higher voltage could destroy the transistors used in the distributed power amplifiers that were known at the time. Therefore, while working on the new MMIC amplifier project at Hittite, I created a new amplifier design that had a wide band of frequency operation and increased the output power of the MMIC amplifier products, while avoiding breakdown of the amplifier due to the increased voltage. One of my designs used three transistors arranged in a stack and electrically connected in series to spread the higher voltage across the transistors and therefore avoid breakdown of the individual transistors. The design also achieved good stability in operation, and operated over a

[redacted]

wide band of frequencies. The device was implemented in gallium arsenide ("GaAs"), a substrate material.

9. Some of the inventions that I conceived and which were used in Hittite's HMC998 amplifier were disclosed and claimed in a series of patents and patent applications, including U.S. Patent No. 9,425,752. I am the sole named inventor on these patents and patent applications.

10. In addition to the patented inventions, we made many design decisions that Hittite chose not to publicly disclose, instead keeping them as confidential trade secrets.

11. [redacted]

12. [redacted]

13. This work led to the commercial introduction, in November 2011, of Hittite's HMC998 amplifier. The HMC998 amplifier operates over a wide band of frequencies (0 to 22 GHz), has good stabilization, and a 2 Watt power output. Before its introduction, I am aware of no GaAs amplifier product of this nature that could obtain a 2 Watt power output. Indeed, through today, to my knowledge, these are the highest power output GaAs amplifiers covering

[redacted]

such decades of bandwidth presently on the market, with the exception of the MACOM product subject to this lawsuit, which came out approximately five years after our product.

14. Mr. Traut did not perform the design work himself, but he was directly involved in supervising this design process. He was well aware of the confidential trade secret design choices, including the three I identify above, the various trials and failures that led to these discoveries, and to the patented inventions.

15. The HMC998 amplifier addressed customers' needs for these higher powered MMIC amplifiers. The HMC998 amplifier has been successful as a commercial product, and it was purchased by large players in the instrumentation and military industries, [redacted]

16. The HMC998 amplifier development took approximately three years of engineering work to develop, test, verify and optimize, requiring three iterations of mask sets (prototypes), and involving many design decisions that Hittite chose not to publicly disclose, instead keeping them as confidential trade secrets.

17. Like many companies that develop semiconductors, Hittite used third party manufacturers (called "foundries") to manufacture its products. For the HMC998, the foundry was [redacted]

18. [redacted]

[redacted]

19. [redacted]

20. [redacted]

21. [redacted]

22. Mr. Traut left Analog for MACOM on February 6, 2015, [redacted]

23. My understanding is that Mr. Traut is now MACOM's Senior Director of Technology and Innovation.

24. In about late 2016, MACOM announced publicly that it was introducing an amplifier product, called the MAAP-011247, that had 2 Watts of power and operated in the 0-22 GHz frequency range. This MAAP-011247 amplifier is pin-to-pin compatible with the HMC998 amplifier. It was apparent to me that the MACOM MAAP-011247 amplifier was introduced to directly compete with Hittite's successful HMC998 amplifier.

25. I am aware of several customers to whom MACOM has attempted to sell its MAAP-011247 amplifiers in competition with Analog's sales of its HMC998A amplifiers. For

[redacted]

example, despite Analog's longstanding customer relationship with [redacted] recently chose MACOM's MAAP-001247 amplifier instead of Analog's HMC998A amplifier. [redacted]

26. [redacted]

27. [redacted]

[redacted]

28. [redacted]

29. [redacted]

30. [redacted]

31. Attached as Exhibits A, B, C, D, and E, are photographs [redacted]

I hereby declare under the penalties of perjury under the laws of the United States that the above statements are to the best of my knowledge true and correct.

Dated: June 15, 2018

By: Keith Benson
Keith Benson

CERTIFICATE OF SERVICE

I hereby certify that this document filed through the ECF system will be sent electronically to the registered participants as identified on the Notice of Electronic Filing on June 29, 2018.

/s/ Steven M. Bauer
Steven M. Bauer